

The Permo-Mesozoic cover sediments of the Seckau-Schladming nappe system and their provenance – a detrital zircon story

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The metamorphosed Permian to Mesozoic cover sediments of the Austroalpine nappes are a clue to understand the paleogeographical framework of the Eastern Alps. Therefore, the metasedimentary cover rocks of the Schladming Nappe and the Seckau Nappe (Rannach Formation) were sampled and age data were acquired through LA-MC-ICP-MS U-Pb detrital zircon dating. The metasediments are characterized by coarse grained Alpine Verrucano type rocks, metaconglomerates and quartzphyllites to pure quartzites. Within the Rannach Formation, they were sampled along the stratigraphic sequence from the (primary) contact to the pre-Alpine basement to the uppermost exposed parts. The detrital zircons of both nappes exhibit a strong affinity to magmatic origin (over 90 % of the zircons have Th/U above 0.1) and geochronological ages range from Mesoarchean/late Neoproterozoic to Permian, with most of the ages lying between Middle Ediacarian to Early Permian. The main KDE peaks found in both cover units are Late Carboniferous to Early Permian (c. 290 Ma), Middle to Late Ordovician (c.450 Ma) and early Cambrian (c. 540 Ma). The main differences between the Schladming and Seckau sedimentary cover is visible within the KDE peaks of Late Devonian/early Carboniferous (c. 360 Ma) and Cambrian (c. 490 Ma), which are only found in the Rannach Formation, and middle Carboniferous peaks (c. 330 Ma), only present in the Schladming nappe cover. Distribution of Neoproterozoic ages suggest a common source from the northeastern Gondwana margin. The ages solely found within the Rannach Formation can be accounted for by an internal source, as these ages are known from the crystalline basement of the Seckau nappe. The KDE peaks found in both cover units might be associated with sources within the Alpine realm, e.g., units south of Tauern Window, while the middle Carboniferous ages only found within the Schladming Nappe cover and the Permian peak of both covers seem to be connected to the Central Gneiss of the Tauern Window.